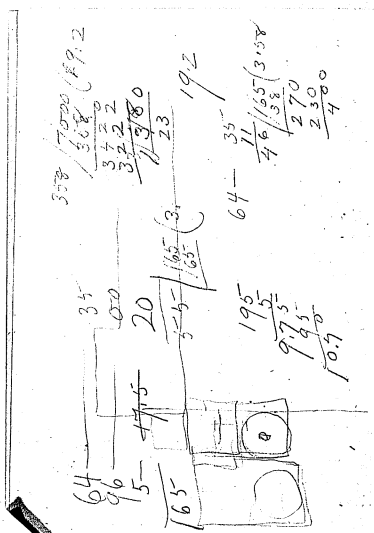
Notebook, N-90-11-07.2

This notebook, which covers the period November 1890-September 1892, is a continuation of N-90-11-07.1. All entries are by Edison. At the beginning of the book are notes regarding some of the 289 compounds from the preceding book, tested as solvents for syrian asphalt. Also included are notes relating to carbonization tests and to squirted filament experiments, as well as drawings and calculations, probably pertaining to ore milling. The front cover is labeled "Book #6008 [608?] Nov 7/90." The pages are unnumbered. Approximately 100 pages have been used.

N-90-11-07.2



Oxidized Linseed oil. Solvents.

182. Isobutylbutirat. semi solvent disintegrates it but only 1/2 apparently dissolved.

213. Kresol Meta_ swells it up very much.

221 Zimitsaure - Alcohol, swells it very much cant say it dissolves as whole of liquid was absorbed added more.

219 - Isopropyl Iodide - dissolves wholly —

145 - aniline swells & partially dissolves it -

135 = 9 thimble $\frac{1}{3}$ to $\frac{1}{2}$ dissolves

62. Extr. Hemlock dont dissolve turns it white -

132 Phenylhydrazin - perfect solvent.

149 - Aethylchlorohydrin dissolves fair & discontinuous.

174 Isobutylbromide perfect solvent with very slight sediment.

159 - Isobutylamine perfect solvent -

113. Neuwin Lösung - good solvent.

244 - Methylamine 33% - dissolves but poly combination = dirty =

245 - Xylenol - swells it greatly absorbed all solution carbody if any dissolved put more solution in -

246 - Butyl Chlorat swelled t
solution till gone put more in

251 - Nitrodiethylen, swelled
liquid gone - put more in

225 Kresol - Ortho - swelled
liquid absorbed put some in

234 - Styrone - swelled
dont think it has dissolved
any -

233 Anisaldehyde - swelled
liquid absorbed cant say it
dissolved any - put more in -

237 - phthylCchloride swelled absorbed - didnt put any more in -

268. Benzol - good solvent for 80 pct of it which sediment appears to be unchanged stuff + dirt -

272 Naptha - good solvent for 80 pct - about same as Benzol -

160 - Pseudocumol - swelled + made light yellow dark think any dissolved -

270 glacial acetic acid
8/2 solvent - disintegrates

276 - Absolute alcohol
nearly dissolves it - put fresh
in + about $\frac{1}{4}$ clear dissolve
probably whole could
dissolve with plenty liquid
+ time - This mixed with
Naptha or Benzol may do
the big =

166 - Cumidin - Isopropylamide Benzol
swells - absorbed liquid
filled it up again

fits -

Dec 16 -

Nitric 1.45° Baume -

No 1 12 grams Sugar in Each

Water 300 cc - 100 acid

No 2 - 300 cc - 100 acid

No 3 300 cc, ~~200 acid~~ 40 acid

No 4 200 cc = 150 acid

No 5 200 cc 100 acid

No 6 150 cc - 100 acid

No 7 100 cc 100 - acid

No 8 70 cc 100 acid

No 9 – 50 cc 100 acid

No 10 30 cc 100 acid

Started Soaking Syr at 10 30 a.m. Dec 16.

No 10 softened and Gelled up Nitrous fumes comes off considerable quantity.

No 9. semi Gelled but floats over top whole death – Red fumes

No 7. 4. 8 dont Gelle some Red fumes – all other quiet.

No 11.

70 Nitric
70 water
70 HCl
12 grams syn —

Filtered 2 pm Dec 17

Nos 10, 9, 8, 7
Filtered at 3 pm Dec 17

6 5 4 3 2 1 — finished
at 10 pm 17th —

No 10 Residue after Exhaustion with Wood alcohol -

6 grammes. 7 Decagrams

No 10 Before Exhaustion with alcohol puffed more than old unpurified.

purified No 10 - decomposes all at once dont swell - large Volume smoke comes off all in 2 seconds then ceases and dont show any Combustion when lowered in flame - dont puff at all - Smoke very inflammable.

No 9 Puffs more than old regular when unpurified — when purified by alcohol weight of residue 7 grammes 8 Decagrs, purified by alcohol dont puff — decompose like No 10 but takes 4 @ 6 seconds, no inflammable matter when lowered in flame.

108. Unpurified smells about the same as ~~[illegible]~~ 4.+.7. but ~~not so much~~ combustable comes off by far as in 4+7.

Purified by Alcohol dont puff in least. Takes some time say 10 @ 15 seconds to decompose, then on lowering in flame no combustable, The particles scintilate showing no softening material at all in it to cake particles together. Weight 8. grammes

No. 7. Unpurified puffs.
about same as 4 –
purified. Weight of Residue
7 grames of Diagramms.
Purified no puff whatever.
takes long time to decompose.
20 @ 30 seconds – afterwards
Lowering in flame no combustion
Scintillations, plentiful.

No. 6. Unpurified
puffs more than acid
Regular -
Purified weight
8 grammes 4 Decagram
Purified puffs slightly
towards end when put into
flame after I thought it
was ok - until then it
didnt puff - takes long
time to decompose. Think
from looks it has largest
residue after decomp but
I may be mistaken -
dont decrepitate. yet
there dont appear much lockin
matter as you can see parted

No 4

Unpurified don't swell as much as old Reg

Weight of purified

8 grammes 7 Decan

purified decamp very slowly and don't puff except at end of heat

it swells up from underneath probably because I look too much It's swelled little more than 6. seems gave great residue – semititalis bubbles on top =

105 Unpurified —
puffs quickly boils
unchanged Syrian acid
Weight after Exhaustion in
alcohol 8. grams 3. Decl
Puffs some towards final heat
at bottom, There is probably
some unacted on Syrian which
could be taken out with
Benzol —

Carbonization in
Evaporating dish to ascertain
Carbonaceous Residum —

No 4 —

1 gram purified by Alcohol
after ignition, residue weighed
4.98 Milligrammes — Carbonization
very slow

No 6.

1 gm
Weight after Carbonization
493 Milligrammes
Carbonization slow.

No 8.

Residue 500 milligrms
decomposes quickly at first
takes 1/2 time to finish as 4 & 6

No 7

Residue 497. milligms

Takes considerable time to decompose - requires high heat to finally decompose

No 9

Residue 485 -

Decomposes very rapidly at first - 9 minutes when weighing pyropovic. -

Charcoal friable -

No 10 –

Residue 483

Decomposed all at once
& quickly furnished –
charcoal frable.

So far No 7 lost

Action of solvents
on purified by alcohol
No 10
Chloroform dissolves out scarcely anything
dark viscous — particles resp. separated
Benzol scarcely anything —
pyridin good but not perfect
I think —

1909 —
Chloroform dissolves scarcely
anything dark viscous — particles
separate —
Benzol nothing
pyridin good —

No 4

Chloroform sticks at – viscous –
dissolves some to opaque yellow
Benzol colored some –
Heated if ground = warm
[illegible] slightly [illegible]

No 6

Chloroform dissolves quite a lot
more than 4 = viscous (very) –
Benzol dissolves more than
4 = if hot it avoided
dissolves very considerably CCl4 –
pyridin not perfect solvent

No 7 –

Chloroform opaque yellow
Viscous =
Benzol some – but might
take considerable –
pyridin good –

No 4 –

Chloroform Opaque yellow
Viscous not extra so as
7 =
Benzol dissolves good
cloud looks like unacted
on sy –
pyridine good not perfect
I think –

No 5 –

Chloroform semi viscous – dissolves to light yellow-brown. Bengal dissolves 1/2 as much as Chloroform. Pyridine good but not perfect.

No 9 with Carr Chloro

Viscous apparently OK

No 7 not quite so vis but good = Carr evidently better for 9 than 7 but Chloro 7 OK =

Sym + Chl water
No 12
750 cc Chlorm water
by Aylsworth 10 grms
Sym - 3 pm Friday -

Raw Syrian Salvia

Naptha apparently dissolves it good though maybe fine specs

Ether takes out something not very much —

Chloroform 1st class

Benzol Next,
Puffs in same

Naptha next.

Benzine - takes out something more than Ether.

Methylic Alcohol may dissolve some transparent stuff -

11 am Saturday

Experiments Oxdyg Syn –

7 A. 18 grammes Sy
100 cc water 100 cc acid

7 B 24 grams Sy
100 cc H_2O 100 NO_3

7 C 30 gms Sy
100 cc H_2O 100 NO_3

7 D 36 gms Sy
100 cc H_2O 100 NO_3

7. E 42 gms Sy
100 cc H_2O 100 NO_3

Residue of 7. E. after Exhaustion
alcohol. 25 grms 600 milgms
The residue dried all night on
heater in the Extraction Gy Cab
not very good — will reexhaust;
in bottle over night —

after good purification. 2.3.500
but some was lost say 24 —

24 — 100 cc
130 grms
1 to 5 —
1 lb 15°

June 6 1891.

Aquartet fulminats from following

No 1. Trichlorophenol mol. 4 grms Carbut: about 2 grms trichlorophenol worked in mortar till sticky then 10 minutes kneading in finger squirts first-class .008 die polished with diamond dust. smooth very shiny

Note – after 6 months puffs more than No 2 when thrown on hot sand bath –

No 2. 4 grms Carbut 1 Camp, Chlo – worked very dry – brittle and cracked ingot: Crumbly when put in press – works fine in press – dont stick to die, fils round and Even but surface not good polish. Outgoes No 1

Note. 6 months after – puffs but little when thrown on hot sand bath, globular puffing only. Surface gets polished – but with olive carbon think it will work ok – dont smell very greatly when put right in flame.

No 3 Alcohal Camp. unpurified. amm nitric — works fine in die —

Note after 6 months. ok but can see its rough & porous — very imperfect locking of particles & Crocky — Either must be used alloyed with Carbut or dipped —

No 4 — Purified by Alcohal amm nitric nitric dissolved by phenylamonia previously well powdered — works only fair in die,

Note 6 months after fearfully rough scarcely puffs at all must be alloyed dipped or it [illegible]ng

No 5 — Negrosin with considerable Camp & methyl. alcohal afterwards added some absolutely ethyl al. went better. worked well in die,

Note — after 6 months found fels all snapped in pieces 1/2 inch long

No 6. Same as No 5 - with smaller Camphor & absolute Ethyl al. only - Works bad in die, probably sticks Camp to Lubricate.

Note 6 months after all cracked as No 5 -

No 7 Facby Native by HCl slow + careful skimming every little while very weak acid plenty H_2O washed in H_2O dried slow, powdered, then Methyl al to which say 1/4 or 1/3 Chlty added worked in mortar taken out kneeded - when held over flame the chunk softens & appears to dissolve better works well in die, puff, it comes out 008. very round but has a rough surface when may give it porosity -

Note 6 months after - round even, but rough + particles not locked together well puffs out considerably but not globular as No 2 but more whole during increase - will have to have a better solvent, or used as alloy or dipped

No 8 Facby Native, HCl, Ulmin. same as 7 but with. Iodoform alone – Rough surface, dent & spunt well, but could be made to if lumps got out. ~~impossible~~
R 009½ 005 + 007. – dent puff ~~[illegible]~~

Note after 6 months. Rough fracture but even + round need better solvent or locking material – alloy or dropping puffs more than 2 =

June 9 1891 — New Expmts
No 10
Old Carbut purified well by Methyla
4 gms Cbnt 1 Cam – ~~plen~~ plenty
Chloroform – heated Carbut slightly
20 g could powder it – It is a very
hard thing to get lumps out in
fact almost impossible – using
10/1000 dil. plumbgod made ringot
as well – worked ingot to stiff
dough – squirt well –

June 8. 91.

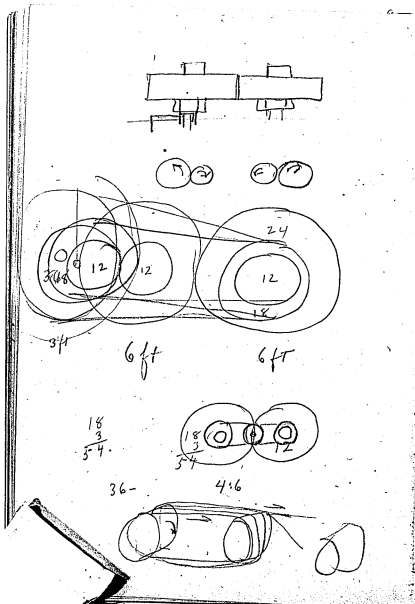
No 11 –

Same as 10 but a good deal of Common Lampblack worked in by fingers – seems to require an extraordinary amount of Chloroform and when you think it ok you find it in a second hard and brittle. While working in Lampblack must drop in at intervals Chloroform from time to time with very sticky mass of Caoutchouc as in No 10 proportions. It will probably be better to make the Caoutchouc very thin and give it time as perfect solution takes place to get rid of lumps due to difficulty of grinding fine and then knead it & work in Lampblack. Perhaps the Lampblack better be added to the very thin solution all at once & then evaporate down & knead –

No 12 Ex purified Reg purified Cassia
but boiled in wood alc
+ just dried it then is easy to
get a good pulverization in Motor
the perfect drying with a
little of the stuff left in which
is taken out by methyl a
stirs it together + is
difficult to pulverize
but when the stuff is all
or practically all taken out
by methyl a + not dried
hard the pulverization is
fine + the stirring does it
perfectly -- No 12 was not a
weighed quantity I was
trying pulverizing experiment
+ put considerably more
than 1/4 Cam dry + tried to
work it dry but had to add

Chloro. I added a small quantity of fenol but got too stiff & I then added sufficient ground it pretty well & then worked to very stiff dough - plumbagoed & ground 10/1000 die worked fine in die - fits round & polished -

A previous experiment with small quantity methyl added to Chloro - caused fels to work well but they were all rotten so lost all -



I have just completed Carbonizing 2 moulds of squeezed fibrous freddy started prelim furnace and run from 75° fahr to 638° fahr in 8 hours — I put them in muffle and was 7 hours getting up to 638°, afterwards took 6 hours to run to Red hot door which I suppose was full yellow ~~—~~ with perhaps tinge of white. for the last hour full wind on and as much gas as gave slight flame 3 inch high through hole in bottom door — used Charcoal powder 1/2 inch over all —

No 1 was shiny a good not puffed - charcoal slightly little Brittleness little Yellow

than Reg bamboo oxidized to point but caused a few there were holes due either to lumps or a fluffy part which oxidized quickly - The perfection of the wgot can easily as well as homogeneity be seen by the oxidization test,

Now in same mould rough not shiny ~~[illegible]~~ brittle but not much more than Reg. bamboo oxidizes not to a point but to a frame work with holes all through like a sponge -

In the 2nd mould was
No 2. This appeared to
shrink much more than the
others. I should say shrunk
in length 1/2 — They are
shiny but would be
brilliantly shining if the
fine charcoal didn't stick.
Perhaps the charcoal shined
be 50 mesh not less than
40 or more than 60 with no
dust. — They are very tough
and almost to a knot &
is difficult to get grip
enough in fingers to break
them by pulling — They
oxidize to a minute point as
fine as silk & show great
homogeneousness —

The original length was about 3 1/2 & they shrunk to about 1 3/4 -. They original die was I think from an 008. The Carbons are 3 3/4/1000 -

No 11. is dull and shows bad places not well but sharp lumps sticking out as if lamp black was not well mixed - It oxidizes rather easy not Even although goes to a point but very bad point being full holes =

On the pumps

No 1 is exceedingly Even when lighted up - They are same length no regular Cubes not having contracted as much as No 2 - 1 in the dark and at the dullest red show no spots whatever - best I ever saw in this respect; They light up without peg on 120 volts. but after working they seem to light up as bright as before working when no peg in - apparently they go up in Resistance; No 2 seems to act this way also. - 1 and

No 7 - Is higher Res. than No 1 -

No 7 - 1 no spots No 7 - 2 and spot 1/2 inch inside from clamp -

No 3 no spots No 7 - 4 & 5 do No 7 no & no spots -

No 2 beautifully Even at low
rid – 2 and – 4 1 pump did not
work = we did not dare to work
too high for fear arcing –
The Vac was not last ~~to~~ gas will
try + save the 2 and Carbons
as they are probably unemployed

~~Carbon~~ Squirt new fils (June 10 1890)

No. 13 4 Carbut 2 trichlorophenol with Mal. ground down until Mal all gone, then there appears to be an oily substance which causes stuff not to adhere to ~~mould~~ mortar. I notice that if solvent is put in raw Carbut only ground a little the lumps never come out no matter how much you grind where if you add Mal alone and grind until dead dry all the lumps go out then the agglutinating dose can be added it, (No 13) kneeds well. The ingot was not very stiff as it takes a long time to get it hard – 20/1000 die. The filament is not very shiny only one now & then I could see lumps of raw unbroken by solvent, apparently – but was broken open by die. Exposing the red tinge of the original. Trichlophenol seems to be non lubricating on the die & without something else mixed with it will be hard to use in smaller dies = There are many specs – when these specs strikes side of die it spoils the fits for long distance by dragging –

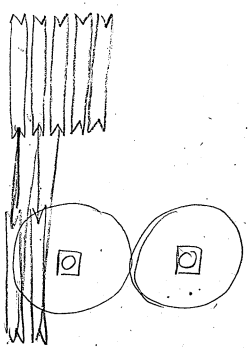
No 14 — June 10 91

Reg highly purified, was afterwards
Extra purified by hot Mal, then while stiff
moist, ground dry in mortar. This makes it very
fine and practically free of grit ~~Xxx~~.
No 14 is 2 gms Carbot. 1 gm Trichlorophenol.
with Mal, it was ground till Mal all gone &
Oil came to lubricate mortar. Dugged it to the
right consistency in mortar by pestle &
rolled it up in fingers = didnt use plumbago
Die 20/1000 — worked well but came out
very rough Trichlophnl is evidently not
a lubricator, perhaps a higher percentage
would make it shiny or mayt not so
stiff present mixt might have worked
OK if I hadnt made it so stiff
Stiffness was not more & I think even
less than Regular.

June 10 '91

No 15

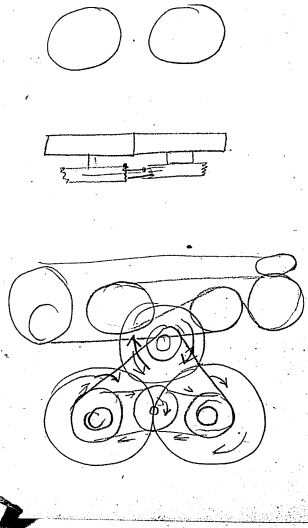
2 grms Carbut 1 grm Trichlorophenol
Chlor. This works well, (Carbut is XX
purified groundwt,) very sticky in mortar
but gradually comes to an ingot
afterwards it must be kneaded
5 @ 8 minutes in hand (or pugd?) it
does not dry fast on surface at all &
gives plenty of time for kneading
Dec 20/1000 - it is quite perfect. the
surface is pretty shiny but under
waves 1/64 @ 1/32 apart and all the fibres
dia pbly measured 10 @ 15 pct at high
swells. the stuck somewhat to glass
rod - The ingot should have been
stiffer or that was too much
Trichlphl — I find after pulling in
box they stuck together somewhat.
took them out & then dried them separate
don't think I injured them very much
= I find on dry 1/2 hour fil collapses
pbly to viscous not hard mass



June 10 91

No 16 is like No 2 but 20/1000 die
2 grms Caubit. 1/2 grm Cani-Chloro mgot.
works well. (XX ground wet mg) best way after it
dry muff grind it in mortar. mgot used,
rather stiff not very viscous; & quite perfect
(shiny) fils broke of their own weight
so had to hold glass rod 6 @ 8 inches
from die, not sticky — fits dead round
dart stick to glass rod

No 17. (XX pfl ground wet)
20/1000 die — 2 grms Caubit, 1 gram
Cani — Chloro — (plenty chloro) works
beautifully in die Tougher than 16,
shine is perfectly satisfactory.
mgot pugged in mortar. tend to
dry about like No 16 — fits dead
round. dart stick to glass rod



No 18.

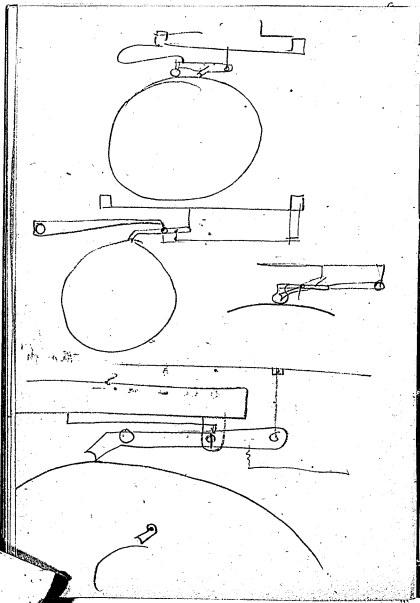
(XX pfd wet) 2 grms C 2 grms Cam – Chloro. Long time to pug fils beautifully shiny but shrunk & did not pug at long enough, nearly all the fils stuck to glass rod & together, managed to get 3 or 4 for test. Evidently equal quantities too much Cam, still extra pugging may do it. ? —

No 19. (XX pfd wet mal)

2 grms C & Chloro only. Easily pugged but must be got to die quick. Must rather hard at surface ~~[illegible]~~ somewhat dry before ~~[illegible]~~ mould — Brittle fil, had to hold glass rod right up to die, shrunk greatly after getting on glass – not least sticky shiny but not so shiny as 16 17 & 18, but nice notice after few minutes fils drawn in & all will pbly go 6 ad

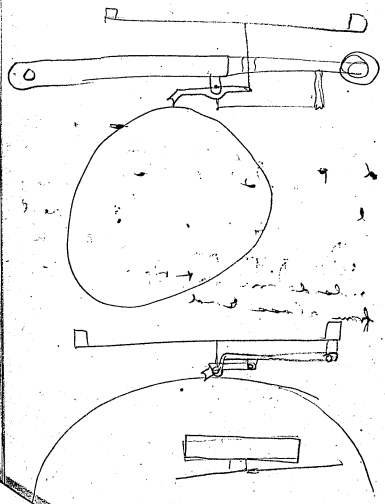
No 20 (XX ground wet)

2 grms C. 1 grm Thymol, – chloro – grms well taken long time to pug two unobjectionable prepared, stiff ing at, yet could have been made very much stiffer + rub ok Dec 20/1900 – works perfect in die tough – shakes loose rad slightly so had to grind slow yet all were saved by pugging a little more would have been perfect, – It has the most brilliant shine of all from 12 to 19 – Exquisite ~~Dark Carbrad~~ like 19 – think there is some solvent action.



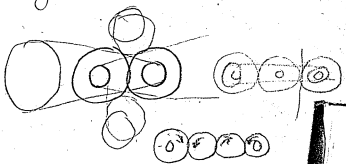
No 21. XX ground wet.

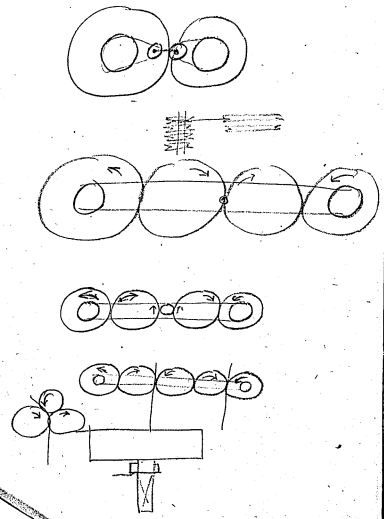
2 grms C – 1 grm Menthol, chloro
slightly, takes long time to pug as it
sticks in opts to mortar when
pouring – even when quite hard
still is easy & might dust dry
quick due 20/1000 die
squirts elegantly. tough –
not brittle at all in glass rod
deal round. Beautifully shiny
They seem to swell less than any
other when put in flame although
this may be a delusion. –



No 22 –

Same as 21. Except .005 die, works fairly well although die slopped up 1/2 day time from dried lumps in pugging perhaps. pugging must be done with great care so as to prevent semi dry lumps – but very shiny – round but inches several diameters poss. due to hard & soft mixt material? a great deal of graphite catches on outside might have come from glass tool.





June 11.91

We now commence carbonizing

Mould 1

Bottom No 15 — ok

next 17 — stuck together somewhat and a little brittle,

No 18 3rd from bottom, very brittle and distorted only got 3 or 4 in.

No 20 stuck together slightly not troublesome though — not cracked but good ~~exp~~ perfect, — Top moved —

Mould No 2

No 21 — good — slight stick perfect on bottom;

No 22 005 — fibro — good some of them thus

will run in prelim — 1 deg falsifiments

Nos 19 + 16 all cracked 15 all shrunk — 14 Rough rehrunk 13 all shrunk

Result of Carbon =

No 15 – shrunk, irregular, warty – no only 4 good – Contraction not ~~so~~ so much as 17. – stored say they were no

No 17 – only one broken, contracted the most by far off all those Carbon – round good – diameter very much diminished compared with others.

No 18. shrunk warty – no – brittle.

No 20 – warty. only got 4 not shiny like 17. – larger diameter.

No 21 – all broken most fibrous good round – those stuck found crack or 2 poly the cause

of brittleness noticed in all

The 005 NO 22 - only got 1/2 doz out of 20 or 30 very brittle not contracted very much in dia or length not near as much as 17 -

Camphor – Melted = dissolves perceptibly Cbt – Very sublimable – nearly all sublimes I dont crystalize – but gives glassy coat Cbt, where thin –

Chl Hyd – Dont appear sublime dissolves perceptibly – on cooling dont give Cabt film – where thick all crystals but after a while when spread out thin – sticky viscous – good dissolve

Anthracene – seems to dissolve more sublimeable than Camphor probably good – Leaves sometimes very thin film Cabt

Chloralalcoholat – Low up dont sublime good solvent of Cbut – Crystalizes after Coal Crystals tinted with Cbut. no film – I doubt if this is good

Chloranil = High MP - Exceedingly sublimable - scarcely able to melt it - It dissolves Chut, painfully to black shiny scale - hard - this would seem to be perp-chin.

Benzanthid - Melts mod Easy sparingly sublimable - dissolves little Chut, Crystalizes strongly on cooling no film seems to run globularly.

Dibromoanthracene.
High MP - no appr dissolving slightly Crystalizes on cooling this might be good stuff to adulterate etc -

Nitro Benzaldehyde (meta)
Low MP – not sublimable – good solvent when very liquid + hot of Carbut, often pouring on bottle which + while nearly cool its viscous but when rubbed with finger solidifies to non viscous friable dull —

Sulpho – Carbanilid –
not Sublimable – Mod high MP.
good Elegant solvent – dries to a ~~Seems to be same chem action~~ – dries to perfect shine
Viscous phy OK if sublimes ability is unnecessary Dont Crystal.

Anthracenan Sublimes very much before melting but finally melts at very high temperature seems to have no solvent action on Chut but perhaps throwing in Chut Chilled it no film – this is good if mere sublimming is required

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Terpin Hydrate 1/2 to 1/3 as sublimable as Camphor Rather high MP – perfect solvent – gives beautiful shine but after drying Crystalizes to dull color poly because of excess of hydrate. This stuff may be as good a Camphor

Betol (Naphlalol)
Melting point moderate —
dissolves but perfectly
dont appear crystalize
Viscous after cooling
dont sublime would be good
to dissolve at high temperature

Napthalamin — M.P. low — very
slightly & slowly sublime appears
appears to dissolve but good
after cooling solution turns
shiny acts curious but
after long while forces shine
& actinulus crystals /

Di-Resorcin — Very high MP —
It changes from white powder to wet looking
stuff very little liquid comes out
95% dont melt. sublimes slowly
think it scarcely dissolves and
Carbonate though it may — by appearing
Clean Carbon particle disappear before
Di Resorcin melts. — this is abnormal
suit for capillary or subliming

Aloin mg sticky pulls out
threads

Diphenylamin — fairly soluble
on cooling actually crystal.
sublimes slightly —

Pyridine sulphate absolutely
insoluble mg

Carbazol - MP high sublimes before melting seems to dissolve but slightly = very sublimable.

Thymol MP Low - very slight sublimable. good solvent in fact Extra good - thin after cooling If thymol used small quantity goes great ways when you dissolve in. Cbt spreads, + dissolves easily without stirring not viscous.

Menthol.. MP very low - not so good solvent as thymol not viscous hard to be stirred still its good solvt. not very sublimable

Hydrochinon – M.P high –
Stains melt c.o. of water. Cryslalization
think it dissolves some about,
sublimes quite rapidly
Chills instantly when poured
surface not shiny dust stuck to
dish.

Ammonia Formiate –
absolutely insoluble

Ammonio sulpho Cyanide
Absolutely insol

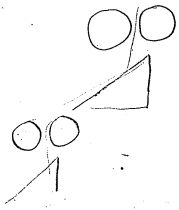
Acid Phtalic, sublimes
readily – seems to dissolve
fairly – mod high M.P.
Chills quick – dull –
Crystalizes slightly.

Phenolphthalein —
Exceedingly High MP.
dont appear dissolve any — not
sublimable.

Camphor Monobromat.
Low MP — pretty good
dissolve. non — sublimable

Aniline Chloral. High MP —
difficult get any liquid
sublimes readily.

Quinidine — Very high MP
Semidissolve at very high temp
not sublimable



Methyloxide Oxalic.
Mod MP Cbt acts queer.
dont appear dissolves in liquid
yet it melts & globulate,
Chaum in thread etc funny.

Turpentine Oil Dihydrochlorat
Low MP dont appear dissolve
on trap just mutts Color it

Monochlorhydrate same as
above

Phenanthrene — Mod low MP
dissolves about somewhat
Crystalline

Oxamide – Doesnt Melt, at all,
Even on wicked slip – flame:
but slowly goes away without
smoke until all gone –

Trichloraphenol low MP
of four dirative – Coal
mechanally – Crystalizes admirably

Ingots.

Regular dose chloro
is — 10 grammes or
2 on right side — not glass

23 — 2 grms C — 1 Cam. 2 drops
pydn with req dose Chloro

24 2 grms C. 1 Cam 5 drops
pydn to req dose Chloro

25 — 2 grms C.. 1300 1250 — mil gm Camp
Req Chloro

26 — 2 grms C 1 gm Cam — 10 drop Pyridi
pug hard req dose Chloro —

27. 2 gms C — 1 Cam 250 mil gm
Sulphur Req Chloro..
note. (I forgot the Camphor)

28. 2 gm C – 1 gm Cam. 250 mil gm
Iodine – Reg Chloro.

on pugging –

29 – 2 gm C – ~~+ Cam~~ Reg Chloro
pugged Anth 1 gm anthracene
+ 5 drops pyridin –

2 gm C 1 gm Chloranil – 5 drop
pyridin – chloro
30 ditto ~~pugged as standard dose~~

31 – Methyl Ci with 20 drops
pyridin in 2 gm C no chloro or
Camphor

32 – 2 gm. C. 1 Cani – ~~2000~~ 300 milgm
photo pbgo Req Chloro, 5 drops pyridin

33. – 2 gm Carb ~~1 gm Anthracene~~,
~~Req dose Chloro~~ two Req dose
Chloro ~~geolinated~~ in the Anthracene
10 drops pyridin

34 2 gm ~~Chloranil~~ Carb. 1 gm
Chloranil – Req Chloro

35 2 gms Carb. 1/2 gm
Chloranil – Req Chloro
5 drops pyridin –

36. 2 gms C – 250 mg
Sulpho-Carbamlid – Reg Chloro

37. 2 gms C 500 mg
Sulpho Carbamlid – Reg Chloro

38 2 gms C 1 gm
Sulpho Carbamlid Reg Chloro

39. 2 gms C – 1 gm Antitrachin
Reg Chloro –

40 – 2 gms C ~~Lepin hydrate~~
250 mg – Lepin Hydrate.
Reg Chloro — Not real in
Chloro — must try other
Oxidants –

41- 2 gms C - 500 mg - Terpinhydrate
Reg Chloro -

42 - 2 gms C 1 gm Terpinhydrate,

43 2 gms C 250 mg - Betol,
Reg Chloro

44 2 gms C 500 mg Betol.
Reg Chloro

44 - 2 gms C - 750. Betol.
Reg Chloro

45 - 2 gms C 1 gm Betol
Reg Chloro

46 2 grms C 1 grm De Resorcin
Req Chloro.

47. 2 grms C. 1 grm Carbazol
Req Chloro

48- 2 grms C. 1 grm Acid Phtalic
Req Chloro

49- 2 grms C 1 grm Quinidine
Req Chloro

50 2 grms C- 1 grm Oxamide
Req Chloro -

51. 2 gms C. 1 gm Camphor 1 gm Oxamide
Req Chloro.

51 ½ = 2 gms - Fulberg HCl - part sol Methyl.
1 gm Camphor. 5 drops Pyridine - Methyl
alcohol solvent =

52 - 1½ g Cbut 1½ gm residue
after Exhaustion by Methyl of Fulberg
Nature, Chloro - + perhaps Mal -

53. ~~2 gms Fulberg sol + Ulal.~~
~~1 gm Camphor Chloro Req -~~

54 = 2 gms Cbut. 1 gm. Meta -
Chlorethy Req Chloro - how abt.
solvent?

55 - 2 gms Cbut. ½ gm Camphor
½ Malachloral = Req Chloro

56 = 2 gr C. 1 gr Monochlorohydrate
Turpentine oil

on. 11th June we put 75 grms Syn
powdered 150 mesh in flat round
glass dish - with 3 doses of
200 cc each, of mixed acid + water
Equal parts -. This is ~~at the~~
rate of 24 grms Sy to 100 cc acid
+ 100 cc water -

Each dish had same - very little
puffing or nitrous fumes; reaction
went on quietly - had to stir it
well at first to get Sy wet;
afterwards only stirred it 2 or
3 times, on the 15th pm we
poured the three dishes in 6 times
their bulk of water from hydrant
in glass jar - well allow it
to soak for hour and then
filter off - and resoak in
fresh water ~~with~~ ground in agate mortar.
put in water. June 16 - 5 am after
grinding - (note, I find particles have
not stuck together but are still
about same size as original 150 mesh
on.

on the 20th June final filtered the whole - dumped the whole 3 jars on the 15th into water, after soaking day filtered, ground, stolyack in Mortar & put in fresh water, stirred 2 days, then filtered & put in fresh water 1 day then filtered The jar water was 10 dia. 12 deep - used our hydrant water -

The resultant stuff ~~&~~ doesnt have the fine yellow of acid stuff but darker a greenish - dissolves better in Chloro & about as much in pile - not very much comes off with Methyl but 1/4 as much as with alcohol - Benzol gives practically nothing with alcohol while it gives very considerable with new stuff & the slubb dissolved out by Benzol doesnt puff in the least in fact the stuff before purification scarcely puffs any = There is very considerable ash in Benzol residue but perhaps not more than in rest, It must be purified by Absolute methyl = [illegible] =

No 23 = I think there was too much Methyl left in it from grinding - I also suspect that the Wood alcohol got down stairs to night is common Wood spirit full of pyroligneous acid I needed a little of it and find that nothwithstanding its exceedingly fine Carbon. It will not dry ash on evaporating dish constantly stirred for 1 1/2 hours - There was strong alcohol (Methyl) fumes come off at first but afterward it gave continuously repulsive acid fumes smelt in pyroligneous spirit. I concluded to wash it out by Ethyl alcohol which I am now doing = The filtrate (Ethyl) is just tinted yellow - I think I smell a sulphurous acid as it smell & makes me cough as sulphurous acid

No 23. with 10 grms Chloro is ~~that~~ much Chloro - 7 grms is plenty so I am going to change it from 10 to 7 grms

I found that when I had got an ingot that the repulsive smell of methyl overcome the pyridin & chloroform. It pugged beautifully in water & didn't stick once - I think I noticed some liquid squeezed out - however I am quite sure the Woodspirit prevented the sticking to water - hence sticking to molar is a good sign - on squeezing the filament was wavy also the skin was broken at points & it was not good - the filaments all stuck together any way = I am going to try 23 over again as soon as ethyl benzene is ok. Dick is distilling some methyl. I find that owing to the fineness of the material that the ethyl takes a long time to fill - over 1½ hours & then

I am compelled to lay open the filter paper while very moist with Ethyl to dry it.
It dries nice and yellow without lumps but it tastes still acid — I am afraid that while it appears dry there will be some water left in it as Ethyl is only 95% — however can be by time thus too dried out = I find that Exhausting with Ethyl clears out the acid liquid hence it is best after working with Methyl. to finally Exhaust with Ethyl.
The material is good & practically free from lumps.
Again I try 23 — 2 gm C 1 gm Cam 2 drops pyridine — 13/4 on left Dropped glass chloro pugged hard until outside dries rather rapidly works beautifully

in die – fils – very shiny and round
of even size. notice frequent lumps
but not enough to lose more than 15%
of fils. – If you squeeze too fast
there is tendency stick to glass
rod but by jerking slow they don't
stick – hang up tube when full
to permit them to dry – made
3 tubes full = on taking off
stick they don't stick – nearly every
one saved – very little loss will
occur with this formula =
We put one tube full in Chg
box reserve the other two for
future export = 008 die. –
written No 2 ~~box~~ side of box – Carbons
are – 0045 – fils 007

No 24 = 2 gm C 1 Cam –
5 drops pyridine – ground well
after ~~to~~ about 2 ~~drops~~ ~~water~~ –
on Drysdale glass chloro –
ground it to free it from
lumps. which was very annoying
doubt use any dry sides on

Mortar = on hand pugged Little.
afterwards pugged very hard in mortar
It pugs well + easy — Squirted
perfectly = scarcely any loss, very
round and even = very shiny
little more than 23 — don't stick to
glass rod as we squirted slowly.
We put one tube full in box ~~[illegible]~~
which is single box the loops being
placed at opposite ends ~~[illegible]~~
No 24 is on No 4 side of a box.
.008 die — Carbon .005 .0075 — ft. —
original length 5 ft — Carbon 4 ft —

No 25 — 2 gm C. 1300 milgm Cam
Scant. 2 Deg Chlors = doesn't dissolve
well can't by any amount of working
got the lumps out. worked long time
afterward took ~~one~~ Balled up got
together rather wet + worked long
time on fingers — afterward
pugged — stuck persistently to
mortar but after while got it
reasonably stiff = hard to
roll the wet with pestle so

as to get it into die – it cracked
in putting it in 1/2 broke off &
was lost still we got a large
quantity good filments it works
well get 80 probably but it doesnt
work so nice as 23 or 24 –
I think it sticks to glass but am
not sure 008 die – it very
round very few lumps –
shiny but as I am now using
electric welding daylight out
say if they are as shiny as 24
but think not = but naturally
they are beautiful = 25 is on
No 1 side of box – Cultrons 004 . files 0065

27 – ~~Sub~~ 2 gms C ~~[illegible]~~ 250
Milgm Sulphur but only part the
dissolved – I forgot to put in the
Camphor = Dies worked fairly but
stuck 2 or 3 times files not shiny
some collapsed inward – not a
success I should say but perhaps
would have been better if
Camphor was put in
No 10 of box Cultrons 0035
files 006

26 = 2 grm C 1 grm Camphor
10 drops pyridin scant 2 deg on
Dewgat glass Chloro =
Takes long time fingers pug after
Took 15 minutes to pug hard in
Water - no fear drying - Can pug as
hard as you please - This was
pugged better hard yet it was.
moist - outside ingot when put in
mould was not dried or Cracked -
The Combustion admits of perfect
ingots being made & pbly by
machinery - It would be satisfaty
if fulminate work in Lamp
The bulk of ingot is much smaller
than when no pyridin used -
have pbly more Carbon in fil -
008 die - It works the finest
in die of any we have ever tried
not a mass or bad fil - didnt
stick to glass - Dead round -
Extra shiny + perfect no
Lumps or fractures notice
occupies No 3 of 60X Carbon 005
fils 008

32- 2 c 1 gm Cam 5 drops
pyridin - chloro - ~~2~~ 300 mfgms
photo plumbago, didn't get all lumps
out. needed about 10 drops pyridin
although it is fair - around the pbgo
in with dry Cbnt, then added
solution - It pugged well in fingers
Couple minutes then pugged it say
7 or 8 minutes in Mortar - work
fine for pugging didn't stick -
008 die works well in die -
didn't stick to rod in slightest.
Dead rounds, notice Lumps Cbnt
not touched with solution -
also effect of pbgo is to give
a broken surface shine with
pieces - ~~2 to~~ fits are good but
not perfect like Reg 2 c 1 Cam
10 drop pyridin - at 5 in bags.
Cartons 0045 fits 0075

32½ = 1 grm Cbnt. ½ grm Camphor
1 grm photographer pbqo 10 drops
pyridin – Grounds well – mixed pbqo
with dry Cbnt = put plenty Chloro
got clear dissolve = pegged some
lime in fingers and long time in
mortar say 15 minutes – got it moderately
hard. always tendency to stick to
mortar Even at the end = think
Excess of pyridin in proportion to Cbnt
made it so should have been 5 drop.
to the 1 gram Carbnt works well
in die – no stick on glass rod –
so twas different to heavy Cbnt had
to use an Extra rod to guide
Cbnt = didnt stick got all –
008 die = Dead Ground but
surface Rough. although the
film seemed to be OK =
put in No. 6. of box – Carbon 006
film 0075

33— 2 grm C— 1/16 Anthracene is not soluble Enough to get 1 grm in the Chloro — so took three amount (1c) 4 Dis on Druggist glass & saturated it with Anthracene, filtered, put 10 drops Pyridine in = Work-ok purgs well, 008, fils not round O oval rough on surface — looks as if Anthracene crystalizes when purging & thus acted as inert powder which always causes rough surface, in No 9. of Box. Carbon 004 fils 006

34 2 gm C – 4 div of Drug measure of saturated solution of Chloranil in Chloroform – could not get 1 gram in or 1/3rd that, used no pyridin, hence was somewhat lumpy – pugged beautifully in mortar, 008. die work fine in die, fils generally round – but the surface is a broken shine or rather lumpy shine microscopic = fils tough, the Chloranil Evidently crystalizes out rather as an inert powder to roughen fil = It certainly acts as a solvent otherwise I could not have pugged it so long or so well, didnt stick to glass, I used nearly all fils – in No 16 of Box. (Stuck together) after Cbyn

36 – 2 gm Cbt – 4 Dw Drug measure of aluminated solution of Sulpho Carbamilid = pat lumpy pugged beautifully = 008 die squeeled good slapped only twice = file Round + oval, 1/2 + 1/2 = Rough shiny In No 15 of 60X = Stick in Cuby

45 = 2 gm Cbt. 1 gram Betal – 2 Dw of Chloro – pugs good – sticks mould nearly to last then good drys quick – 008 die squints beautifully – Thus tendency to stick to Rod – run slow then off Could have pugged it a little harder & think

filament. Round shiny -
pretty near as shiny as best
but not quite — Tough —
think toughest we have
had — No 11 in Box.
didn't lose any fil = Stack in Carb
beautiful shape

51 $\frac{1}{2}$ = No 13 in box = works ok in
water pings well — equal
carb 008 — file rough
looked ok under micro in original box
Carbon 006 fils 008

53. = ~~2~~ is the same as No 26
but is equated with a 005
die = works beautiful quick
once or twice — fils had
occasionally Kinks say 10 pct
stuck little to rod could easy
make 100 a minute = perfect shape
ground = No 7 in box -
carbon 003 fils. 00525
original length 5 $\frac{1}{2}$ — Carbon 3 inches — OVn

These were all preliminaryed for to 630 deg-fahr for 8 hours and run to maximum heat of gas muffle furnace in 7 hours.

Most all the fils were fused together Except the phyo & the aos-fils - get record from Joe & also oxidize them & report.

56 — 2 grms C. 2 Div Chloro — 40 drops pyridin = nice dissolve no lumps worked it down by blowing afterward. Called it & pugged 10 mins in hand - rather sticky - but got ok then pugged long time in mortar say 15 minutes till got hard mort, could have got it even harder if necessary as it squirted beautifully got every one only one kink noticed, ~~fils~~ fil. didnt stick in slightest to rod all the fibres look well on rod and after 10 minutes dont Curl or appear to shrink uneven under Microscope they appear dead round but the shine is not Equal to Camphor fits - but very good rayofrect. Think these will have more Carbon left than with Cam —

(57)

57 = ~~ABSAN XI~~ 57. = ~~MEAN~~ about 25

Fulberg - but there is some doubt of it is known as I have two preparations under same No = 1st is 1½ Fulberg, 1 chipl, 20 drps furfurol, to long time pouring down to urgent. stir to glass rod, water frothing - indie had change from 005 to 008, then it kinked, want phys I think only got few — or it is the following if there are many phrase then it is as follows — 57 — 1 Carbut, 1 Fulberg 200 mg Camphor 20 drops dipi Little Mal Chloro — etc.

58. 2 Chout, 300 milg Camphor 40 drops dipi, Chloro 005 die Takes long time to prep works Elegant indie prepared quite hard but there is a tendency to stick to glass rod, Think there is an unnecessary amount of pyridin used file are dead round & generally fired flame surface not a dark shine

59 2 Cbut, 200 mlgms. Cam
40 drops pyridin Chloro soaked
for 10 minutes + then purged off.
took long while ovated like 58.
works well in die stuck 3
times filo round but dullish
not shiny appearance rather
free defects

No 60 2 Cbut. 500 mlgms
Camphor. 20 drops pyridin
purge well dont require so
long a time as 59 — & harder,
not. squirts fairly die
stopped 4 times but Cast runs
got 1/2 of whole output what
stopping fils shiny showing
Camphor lubricates — dead round
scratch free flaws stick to glass
rod somewhat. but after wards ok
Could have purged handsomely
005 die 9 thick —

61 — 2 Chst 500 mil gms
Chloral Hydrate, 20 drops
Pyridin — Chloro — 2 quart ~~well~~ fur only
pings well — stopped once in
dis = fibre round & clear
free spots fairly shiny
005 dia 9 thick —

Nos 56 to 61 & also Nos of
the previous file left over —
We hung in glass rods in prelim
furnace and in 5 hours brought to
350 deg. They contracted about
1/2 inch — then put back
again to 630 in 5 hours
they contracted about inch or
1 1/4 = But the great contraction
did not take place hence it
must be the critical point is
just occurring but we now
put them in naked boxes, on the
22nd I am to run them to final in
gas muffle furnace —

Sept 27/92

Some experiments mixing various things with Syrian asph hot melted, then pouring in a slab + putting into a steam jacketed press while cold + squeezed. — then the (.005" die) pls are put in kerosene with 1 2 3 + 4 cc of Chloride of sulphur respectively + allowed to soak after a time pieces are to be taken out + Carbonized to see how far Chlorination has gone in —

No 1. Bright fracture Syrian melted with unboiled linseed oil in considerable quantity. Clear enough, not gassy or puffy very little gas came off — poured on card (brass plate) cut strips with shears + rolled them up + put in press — pls perfect under microscope no bumps or defects — very electrical and have trouble to handle — total fill used 3 oz 6 oz of 1 cc Chloride sulphur in the kerosene —

No 2 do 2 cc Chl S
No 3 " 3 " "
No 4 " 4 " "

over

Sept 27/92

No 5 — is the same as No 1 but with very considerable amount of asphalt added so as to diminish the quantity of boiled linseed, makes shiny black fil perfectly cured use a little less oil, but no dilution in No 1 — tough — 1 cc Chl Sul

No 6 do 2 cc chl Sulphur
No 7 " 3 " "
No 8 " 4 " "

No 9 Syrian very little unboiled linseed + lump of Camphor — rather spongy — dont give good break like 1 + 2 — squirts beautifully fils perfectly apparently — air or rather vapor of Camphor that makes it spongy probably underneath + hot pressure consolidates it ok —
1 cc chl Sul
No 10 2 " " "
No 11 3 "
No 12 = 4 " " "

JVB

No 13 – Syrian – Japan Wax – mixes
Elegantly – black fracture, not topaggy
very little seems to do big although
Considerable wax in this – Melt to thin
liquid – works well in die – tough,
fills perfect.

1 cc Chl Sulphur

No 14 2 cc "
No 15 3 cc "
No 16 4 cc "

Bottles put away

475 − 30 = 445

445 − 195 = 250

67

22 8/30

60 − 14 = 46

46 − 26 = 20

20 − 2 = 18

23 8/30

36 3/43

377 − 35 = 342

342 − 42 = 300

300 − 45 = 255

1001 − 140 = 861

861 − 255 = 606

606 − 60 = 546

546 − 195 = 351

288 − 160 = 128

128 − 224 = 904

904 − 280 = 624

624 − 504 = 120

120 − 45 = 75

75 − 40 = 35

35 − 18 = 17

675 wages
87 Cord bit
72 Pen
90 Rolls
24 Stalls
32 screws
20 Bolts
40 Crushers

675 − 87 = 588

588 − 72 = 516

516 − 90 = 426

426 − 24 = 402

402 − 32 = 370

370 − 20 = 350

350 − 40 = 310

310 − 10 = 300

300 − 10 = 290

290 − 2 = 288

288 − 32 = 256

256 − 3248 = 0

25/3

45 − 25 = 20

20 − 5 = 15

15 − 3 = 12

12 − 2 = 10

14 3/7

75 − 14 = 61

61 − 275 = 0

190 − 3 = 187

187 − 3 = 184

184 − 3 = 181

181 − 3 = 178

178 − 3 = 175

175 − 3 = 172

172 − 3 = 169

169 − 3 = 166

166 − 3 = 163

163 − 3 = 160

160 − 3 = 157

157 − 3 = 154

154 − 3 = 151

151 − 3 = 148

148 − 3 = 145

145 − 3 = 142

142 − 3 = 139

139 − 3 = 136

136 − 3 = 133

133 − 3 = 130

130 − 3 = 127

127 − 3 = 124

124 − 3 = 121

121 − 3 = 118

118 − 3 = 115

115 − 3 = 112

112 − 3 = 109

109 − 3 = 106

106 − 3 = 103

103 − 3 = 100

100 − 3 = 97

97 − 3 = 94

94 − 3 = 91

91 − 3 = 88

88 − 3 = 85

85 − 3 = 82

82 − 3 = 79

79 − 3 = 76

76 − 3 = 73

73 − 3 = 70

70 − 3 = 67

67 − 3 = 64

64 − 3 = 61

61 − 3 = 58

58 − 3 = 55

55 − 3 = 52

52 − 3 = 49

49 − 3 = 46

46 − 3 = 43

43 − 3 = 40

40 − 3 = 37

37 − 3 = 34

34 − 3 = 31

31 − 3 = 28

28 − 3 = 25

25 − 3 = 22

22 − 3 = 19

19 − 3 = 16

16 − 3 = 13

13 − 3 = 10

10 − 3 = 7

7 − 3 = 4

4 − 3 = 1

1010 − 30 = 980

980 − 6 = 974

4000 − 1000 = 3000

3000 − 1000 = 2000

2000 − 1000 = 1000

1000 − 1000 = 0

2280

453 − 5 = 448

450 − 500 = 950

950 − 81 = 869

869 − 45 = 824

824 − 85 = 739

739 − 20 = 719

719 − 881 = 838

838 − 90 = 748

748 − 20 = 728

728 − 30 = 698

698 − 24 = 674

674 − 60 = 614

614 − 15 = 599

599 − 1120 = 521

29 400 600 161

50. 480 457 428 29

383. 25 20 428

1120 | 4300 3360 9400 8960 440

23 3 69 12 81 3 | 33

1120

2 - 300
2 - 300
2 - 600
2 - 250
4 500
2 1000
8 370
4 400
4 350
12 500
9 750
6

84

1400 | 35c
300
2000
1453

138

140 | 400 | 2
280
20

400

375 | 1700 | 21
370
450
8400

1250

500

400 | 1210 | 30c
1200
10

4250 -
8400
1295
112
13850

2 - 300
2 350
8 1000
500
4 300
2 750
6 = 500
2 300
2 250
42550

N-90-11-07